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Chrysler Group's SRT Adds Even More Horsepower to HEMI®

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- A new level of HEMI® performance: 25 percent more power - 85 additional horsepower
- SRT 6.1-liter HEMI V-8 produces 425 horsepower and 420 lb.-ft. of torque
- SRT HEMI's 69.8 horsepower-per-liter rating exceeds even that of the legendary 1966 "Street HEMI"

Back in the day, it was nicknamed the "elephant motor," and its ability to make fearsome amounts of power led to more than four decades of performance exploits on streets and racetracks.

Although the Chrysler HEMI® was born in the 1950s and entered into legend in the 1960s and '70s, today's version took much of its inspiration from the original - particularly the namesake hemispherical combustion chambers that provide power and efficiency.

But when powertrain engineers at Chrysler Group's Street and Racing Technology (SRT) set about developing their own 6.1-liter version of the HEMI V-8, the mandate was more: in all, 25 percent more power – an additional 85 horsepower and 30 lb.-ft. of torque - than the 5.7-liter HEMI first found in the Chrysler 300C.

The result is a 425-horsepower, 6.1-liter HEMI with the highest specific output of any V-8 engine ever offered by the Chrysler Group. Its 69.8 horsepower-per-liter exceeds even that of the legendary 1966 Street HEMI.

"The HEMI continues to resonate with consumers and has become a brand within our brands," said Eric Ridenour, Executive Vice President, Product Development, Chrysler Group. "With the introduction of the 6.1-liter HEMI, we're taking the legendary HEMI to a new level of benchmark performance."

The development of the SRT 6.1-liter HEMI V-8 started with a world-class foundation - the Chrysler Group's 5.7-liter HEMI V-8 engine. From there, a team of SRT powertrain engineers integrated race-proven engine technologies to create the powerful new SRT 6.1-liter HEMI.

The developers of the SRT 6.1-liter HEMI engine achieved their goals - 425 horsepower, 420 lb.-ft. of torque - with time-honored methods: add more cubic inches, increase compression ratio, redesign the cylinder heads, intake and exhaust systems for better flow, and increase engine speed.

To employ these methods, SRT engineers modified or upgraded many components of the 5.7-liter HEMI engine to create the new 425-horsepower SRT 6.1-liter HEMI engine.

SRT 6.1-liter HEMI Engine Block and Lubrication System

The basic, deep-skirted engine block structure is redesigned with reinforced bulkheads to handle higher loads.

To get more air in and out of the cylinders, SRT engineers bored out the diameter of each cylinder by approximately 3.5 millimeters in order to increase the total displacement from 5.7 liters to 6.1 liters. Cylinders are honed with torque plates to ensure a truer bore, to reduce friction and increase power.

Oil squirters, aimed at the underside of each piston, are added to aid piston cooling for engine durability. A special oil pump pressure relief valve is added to accommodate the squirter oil flow.

The oil pan and windage tray are modified to manage oil return to the pan sump at high engine speeds and improve power.

SRT 6.1-liter HEMI Piston Assembly and Crankshaft

Larger-diameter, flat-top pistons with high-load capability are specified to handle the SRT 6.1-liter HEMI's compression ratio, which was increased to 10.3:1 from 9.6:1. Connecting rods are redesigned and make use of higher-strength powder metal material. New floating piston pins are introduced to handle higher loads.

The SRT 6.1-liter HEMI's crankshaft is forged from micro-alloy steel and rotates in tri-metal main bearings for high-load capability. The crankshaft damper is retuned for higher engine speeds.

SRT 6.1-liter HEMI Cylinder Heads and Valvetrain

The SRT 6.1-liter HEMI features cylinder head ports designed with larger cross-sectional area. This allows 11 percent higher flow in the intake ports, and 13 percent higher flow in the exhaust ports.

A billet steel, high-strength camshaft features more overlap and lift for better performance.

Intake valves feature hollow stems and 2 mm larger heads compared to the 5.7L engine, allowing more air flow. The hollow exhaust valve stems are filled with sodium to dissipate heat efficiently. Premium valve springs with external dampers enhance the SRT 6.1-liter HEMI's valvetrain and enable higher engine speed operation to 6,400 rpm. The valvetrain system enhancements allow the peak output engine speed to increase to 6,000 rpm from 5,000 rpm – a 20 percent increase.

SRT 6.1-liter HEMI Intake and Exhaust Manifolds

Continuing its air-pumping efficiency, engine breathing in the SRT 6.1-liter HEMI is improved with specially designed intake and exhaust manifolds.

The cast aluminum intake manifold is designed with shorter, larger-diameter and tapered runners for high-speed tuning. Internal runners are core-dipped to smooth the runner finish and improve air flow.

Fuel injector flow capacity is also increased by 14 percent over the 5.7-liter engine. Electronic throttle control is shared with the 5.7-liter HEMI, but breathes through a revised high-flow air cleaner box outfitted with a tuned resonator delivering a deep performance sound character (and good for an extra eight horsepower).

Exhaust headers on the SRT 6.1-liter HEMI are individual tubes encased in a stainless steel shell. Exhaust runners allow increased gas flow while maintaining fast catalyst light-off, while adding 12 horsepower over the 5.7-liter engine's cast manifolds.

The net effect of the race-proven performance recipe of enhancements is to unleash more energy in the combustion process.

SRT 6.1-liter HEMI Engine Management System

To control the combustion process, SRT engineers fine-tuned the engine management system using dual knock sensors with premium fuel.

Air-fuel mixtures are ignited by two spark plugs, with platinum tips, in each cylinder. Spark plugs are fired by individual coils for each cylinder, sitting on isolated cylinder head covers, which are adorned with a traditional HEMI black wrinkle finish.

The Bottom Line

The end result is an SRT 6.1-liter HEMI engine that makes 25 percent more horsepower than the 5.7-liter version in the Chrysler 300C and Dodge Magnum RT, yet maintains the HEMI's reliability and durability, smooth idle quality, reasonable fuel economy, and meets EPA emissions standards.

The 6.1-liter HEMI engine is built at the Chrysler Group's Saltillo Engine Plant in Saltillo, Mexico.

SPECIFICATIONS

Dimensions are in inches (millimeters) unless otherwise noted.

ENGINE: SRT 6.1-LITER HEMI® V-8

Type and Description	90-degree V-type, liquid-cooled
Displacement	370 cu. in. (6059 cu. cm)
Bore x Stroke	4.06 in. x 3.58 in. (103.0 x 90.9)

Valve System	Pushrod-operated overhead valves, 16 valves, conventional hydraulic lifters, all with roller followers
Fuel Injection	Sequential, multi-port, electronic, returnless
Construction	Deep-skirt cast-iron block with cross-bolted main bearing caps, aluminum alloy heads with hemispherical combustion chambers
Compression Ratio	10.3:1
Power	425 bhp (318 kW) @ 6000 rpm, (69.8 bhp/L) (estimated SAE net)
Torque	420 lb.-ft. (569 N•m) @ 4800 rpm (estimated SAE net)
Max. Engine Speed	6400 rpm (electronically limited)
Fuel Requirement	Premium recommended
Oil Capacity	7 qt. (6.6L)
Coolant Capacity	14 qt. (13.25L)
Emission Controls	Dual close-coupled three-way catalytic converters, quad heated oxygen sensors and internal engine features

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